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HOW TO COPE WITH THE URGENT NEED FOR STATISTICAL SERVICES IN DEVELOPING COUNTRIES

By Leo TORNQVIST,
Professor,
University of Helsinki, Finland

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HOW TO COPE WITH THE URGENT NEED FOR STATISTICAL SERVICES IN DEVELOPING COUNTRIES.

by

Leo Törnqvist, Professor,

University of Helsinki, Finland.

1. The importance of statistical services for developing countries.

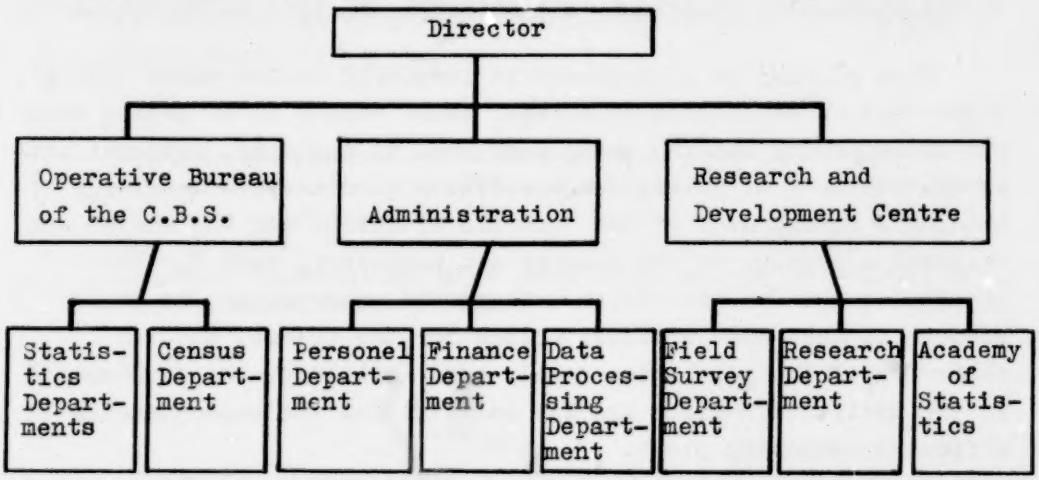
When working as a UN-expert in Indonesia in the years 1960-61, I saw that in developing countries, there really is an urgent need for establishing and improving many kind of economic, cultural and social statistics. Relevant and reliable quantitative knowledge about the development of the economic situation and the social and cultural structure of the country are necessary, both for the government and for the public and private enterprises, in their efforts to make more efficient plans for the future, and for observing if their policies really have influenced the development in the desired direction and for anticipating the consequencies of different competing plans.

To meet this urgent need for statistical information, we must first educate a sufficiently large number of statisticians who can produce the information needed and can correctly interprete the statistical information available. Further, the trained statisticians must be effectively organised to get the new data needed as rapidly as possible. This will require that a statistical research and development centre is built up, in which the best trained statisticians work as a team aiming to function as a dynamic force, doing the hard work to get the new activities started on a sound base and analyzing the results obtained. This centre must also be

responsible for the training of newcomers in the statistical field. During the first five to ten years it will be necessary to get experts from abroad to build up such a centre because the few outstanding statisticians available in these countries are already overloaded with administrative work. These statisticians will need the centre as a brainstrust for working out the "blue prints" of the new activities.

2. The organization plan for the Central Bureau of Statistics in Indonesia.

The following organization chart shows how the Research and Development Centre according to the request approved by U.N. Special Fund has been related to the Central Bureau of Statistics in Indonesia



This type of organization is, I think, a good model also for other countries. It shows the main tasks of a statistical organization for a country. It was developed by a comittee planning how the organization of the Bureau could be strengthened so that it would become an effective tool for producing the statistical information needed.

It can be mentioned that the Data Processing Department has to assist the departments of the Operative Bureau and the Centre. The experts in data processing will also have the duty to teach in the

Academy.

The building of the Centre will require international assistance. The need of foreign experts during the building of the Centre is seen in the following scheme.

Area of specialization, duration and timing of expert assistance.

Statistical Activity	first year	second year	third year	fourth year	fifth year
1. Academy of Statistics	x	x	x	x	x
2. National Income	x	x	x	x	
3. Trade and Industry	x	x	x	x	
4. Agriculture	x	x			
5. Vital Statistics, Labour and Manpower	x	x			
6. Transportation and Communication	x	x			
7. Prices and Finance	x	x	x	x	
8. Field Organization	x	x	x		
9. Data processing	x	x	x	x	
Total number of experts engaged	9	9	6	5	1

The qualification required from the experts is a thorough knowledge in the field of specialization. The senior advisors in statistical studies and research and the expert in national income statistics should have doctorates according to the job descriptions. All the experts will have the duty of contributing to the training programme of the Academy of Statistics.

3. The tasks of the Statistical Research and Development Centre in Indonesia.

The Centre consists of three departments called the Field Sur-

vey Department, the Research Department and the Academy of Statistics. These names refer to the three main tasks of the Centre: 1) To plan how to obtain new data from fields not earlier covered by statistical information. 2) To do research work to find out the useful facts obtainable from existing data and 3) To train new workers in the field who can really do the practical work needed before valuable statistical information can be obtained. It should be kept in mind that a member of the Centre has to make his contribution to solving these three tasks according to his abilities. The big planning projects will require the united efforts of all members. The Centre as a whole will assist the director of the Bureau as a staff for reaching the overall goal of developing the statistical services of the country.

The Field Survey Department has to strengthen the existing field organization for obtaining new statistical data by means of National Sampling Surveys of a type well known in India. The main task of the Research Department will be to develop a National Income Accounting system for the country. Before this task can be done succesfully, many different branches of statistics must be improved. A Census has already been taken in Indonesia in 1961. The results of this Census will form the starting point for demographic research to be done in this department.

The Akademi Ilmu Statistik has been working since 1 October 1958. The aim of the Academy is to provide a three year course in theoretical and practical statistics with such supporting subjects as English, economics, sociology and mathematics, necessary in order to train technical and semi-technical personnel for the development of public administration. The Academy is the only educational institution in the whole of Indonesia giving professional education to statisticians.

4. How to train the statisticians needed.

During my stay in Indonesia, one of my main tasks besides teaching statistics was to establish standards for the requirements for the certificate of merits in statistics and the new academic degrees, Bachelor of Statistics and Bachelor of Science with Honours in Statistics.

Every student of the third year class obtained a certificate

of merits at the end of the obligatory courses. This certificate showed how many lectures were given in the courses attended and the relative standing of the student in the tests of these courses. At most, one third of the students in the class got the highest mark 3, at most one third the weakest mark 1, and the others the medium mark 2. No student was failed because every pupil trained was considered valuable for some kind of statistical work. For the choice of suitable positions for these students such a certificate was considered to be very useful. Most students continued the studies for the Bachelor of Statistics degree after the obligatory courses. For this new degree, it was required that the student prepared and defended a seminar paper and read thoroughly about 1500 pages of statistical textbooks. A standard choice was as follows:
Hald: Statistical Theory with Engineering Applications.
Snedecor: Statistical Methods.
Cochran: Sampling Techniques.
Many variants of this reading course were however possible, depending on the books available in the library, and the interest of the student. Variety was considered to be useful for obtaining statisticians with different special knowledges. A good library in statistics must be built up to make it possible for the statisticians to obtain such further information which might be necessary in different applications.

The requirements for the Bachelor of Statistics degree corresponds to at least 2/3 of the efforts required in the University of Helsinki for a Master of Social Sciences majoring in statistics (laudatur). The full course for a Master degree would still require in Helsinki a master thesis (about 50-80 pages) and further reading of advanced or special books of about 1000 pages.

The students were given an opportunity every month to sit for B.St. examination. To pass the examination 50% of the maximum credits obtainable in the tests was required. After the written examination an oral examination was held. Sometimes students on the boarder line of failing were given six exercises to be solved as home work before they were accepted for the oral examination.

Students with more than 75% of the maximum credits in the written test and who had written good seminar papers and performed well in the oral examination were given the honour remark: Magna Cum laude. The "laudatur in statistics" is reserved for bachelors

of statistics who continue their studies for Bachelor of Science, with honours in Statistics or a master degree.

My experience in attemping to produce good statisticians speaks for a system of education, where the time is about evenly divided into three parts: Hearing lectures, Reading books and Doing exercises or performing research tasks. These means of learning should be used at every stage of the development towards a degree. At the beginning, the lectures play a relatively larger role than in the later stages when reading literature and research tasks become the main tools. The lectures and seminars should put their main efforts into making the students interested in the subject, researchminded, and aware of the high quality requirements on reliable statistical information to be produced.

The students should become selfcritical and obtain the habit of trying to estimate the probability that a statement made is wrong. They have to learn to think systematically and constructively. Without being succesful in developing their minds in this direction, the pupils will not master statistics and become really useful for improving and enlarging the production of statistical information needed. We have thus to remember that it is not enough that the new statisticians have a sufficiently wide knowledge of statistics. They must also become quality minded and accept the ethos of science before good results of the training process can be expected in the long run. The students should be encouraged to teach their assistants the basic elements of statistical thinking and learn how to train others who have not been taught statistics in the Academy.

The weaker the intellectual capabilities of the students are, the more time they need for exercises and reading. To fulfill satisfactorily the requirements for a "Bachelor of Statistics" degree, the weaker students will need almost one year longer than the brightest students who usually have already at the start a better command of English and Mathematics. Some of the students will allways be too weak to be able to reach a degree in a reasonable period of time, but, if they have got a sufficient amount of training in basic statistical work, they may, nevertheless, be very useful in a statistical organization and deserve to get a certificate telling the employer how well they have performed. The certificates of merits should show their relative standing in the class.

The brightest students must be considered as the most valuable

assets for building up an effective statistical service organization for the country. It will pay off to encourage them to continue their studies up to the upper limit of their potentialities. If the teaching staff of the Academy had one fully competent professor in charge of the further education of the Bachelors of Statistics, it would be possible to prepare them well before they go abroad for postgraduate work on Ph.D. level. It must be considered as a goal for all statistically less developed countries to have competent professors in statistics of their own, who can take over the main responsibility for making their countries well developed in the field of statistics. A country well developed in the statistical field has, in my opinion, good chances of making rapid progress also in other fields needing planned efforts.

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